

**AMENDMENTS TO THE DRAWING**

**(None)**

## REMARKS

This application was filed with 22 claims, all of which were rejected. Claims 1 - 10 and 12 - 22 were rejected under 35 USC § 102 (b), while claim 11 was rejected under 35 USC § 103. The Sec. 102 rejection is stated as follows:

“Claims 1-10 and 12-22 are rejected under 35 U.S.C. as being clearly anticipated by Thompson (4865275). Thompson shows the claimed aircraft in figure 7.”

The invention at issue is a foil having a configuration which, when placed in motion through a fluid medium, generates lift with a concomitant drag that is substantially lower than the drag of foils in prior art known to applicant. This drag reduction has the potential of enabling considerable savings in fuel costs. The application has 5 independent and 17 dependent claims. The independent claims are nos. 1, 4, 16, 17 and 21. Claims 2 and 3 depend upon claim 1, claims 5-15 depend upon claim 4, claims 18-20 depend upon claim 17 and claim 22 depends upon claim 21.

Claims 1-3 are directed at a method which is practiced in a lifting foil having an upper course extending sideward between an upper starboard end and an upper port end, and a lower course extending sideward between a lower starboard end situated opposite a lower port end; the courses being immersed in a fluid medium and in relative movement therewith in a first direction, X. The claimed method comprises four steps which cooperatively reduce spanwise flow of the fluid in a second direction, Y, perpendicular to X. These four steps are:

- “(1) constructing a starboard flow guide comprising an upper section, a mid-section disposed alongside said upper section and a lower section disposed alongside said mid-section, opposite said upper section,
- “(2) attaching said starboard flow guide between the starboard ends of said upper and lower courses by blended connection therewith,

- (3) constructing a port flow guide comprising an upper section, a mid-section disposed alongside said upper section and a lower section disposed alongside said mid-section, opposite said upper section, and
- (4) attaching said port flow guide between the port ends of said upper and lower courses by blended connection therewith,

Thompson teaches a multi-media craft, able to carry a lone occupant across dry terrain, or in flight through the air or submerged in a body of water. While Thompson's apparatus necessarily encounters fluid drag during operations in air or water, the reference does not teach anything about fluid drag or how it may be reduced. The terse language of the rejection gives no clue as to the reason why Thompson's multi-media craft is considered to anticipate Applicant's foil. The Thompson patent makes no mention of any element equivalent to the above-mentioned flow guides and therefore does not anticipate the invention claimed in any of claims 1-3.

Claims 4-10 and 12-15 are drafted in the "Jepson" style, all being limited to a combination of elements arranged "in a lifting foil". These eleven claims all incorporate the following language:

- "(a) A lower course having a lower starboard margin and a lower port margin, said lower course extending sideward between said lower starboard margin and said lower port margin for generating a first fluid reaction force having an upwardly directed lifting component,"
- "(b) An upper course having an upper starboard margin and an upper port margin, said upper course being positioned above said lower course and extending sideward between said upper starboard margin and said upper port margin for generating a second fluid reaction force having an upwardly directed lifting component,"
- "(c) A starboard flow guide extending vertically between said lower starboard margin and said upper starboard margin, for suppressing starboard-side vortex generation and
- (d) A port flow guide extending vertically between said lower port margin and

said upper port margin, for suppressing port-side vortex generation.”

Thompson has no teaching relating (inter alia) to flow guides or to suppression of vortex generation. Furthermore, the Thompson reference does not disclose any of the above quoted four elements (a) - (d) or their equivalents. Therefore, none of claims 4-10 or 12-15 are anticipated by Thompson and none violate 35 USC § 102(b).

Claim 16 reads as follows:

16 A lifting foil comprising.:

- “(a) A lower course having a lower starboard margin and a lower port margin, said lower course extending sideward between said lower starboard margin and said lower port margin for generating a first fluid reaction force having an upwardly directed lifting component,
- (b) An upper course having an upper starboard margin and an upper port margin, said upper course being positioned above said lower course and extending sideward between said upper starboard margin and said upper port margin for generating a second fluid reaction force having an upwardly directed lifting component,
- (c) A starboard flow guide extending vertically between said lower starboard margin and said upper starboard margin, for suppressing starboard-side vortex generation ,
- (d) A port flow guide extending vertically between said lower port margin and said upper port margin, for suppressing port-side vortex generation, and
- (e) Said lower course having a keel-shaped underside to provide a sideslip-reducing dihedral angle.”

The starboard and port flow guides, elements (c) and (d), clearly distinguish claim 16 over

Thompson, and therefore the claim is in compliance with 35 USC 102(b).

Claims 17-20 read on a lifting foil having upper and lower courses comprising margins which are secured to starboard and port flow guides. Again the inclusion of the flow guides distinguishes the claimed invention from Thompson and overcomes the §102(b) rejection.

Claims 21 and 22 read on the method of suppressing wing tip vortices by collecting spanwise flowing fluid and directing it to common termination points. The dynamics of the vortex suppression process are explained in the specification, with reference to Fig. 6. Thompson contains no hint of such a process, and therefore claims 21, 22 comply with 35 USC §102(b).

We turn now to the rejection of claim 11 under 35 USC §103. In support of the rejection the Office action states that it would have been obvious to make the wing of Thompson more oval as taught by Eger since it would increase lift. Applicant respectfully disagrees.

Claim 11 is a dependent claim which by reference includes the limitations of all of claims 4-9, as well as the recited axis ratio of approximately 3.0. Consequently claim 11 inherits (inter alia) elements of claim 4 calling for starboard and port flow guides (16, 18) extending between associated margins (52, 56 and 54, 58) for suppressing starboard and port vortex generation, plus limitations of claim 5 providing that the flow guides are secured to the courses by smooth, continuous connections which blend into the courses at their margins.

Eger's patent shows a box-wing aircraft configuration which was well known at all times of interest herein. It is not seen how Thompson and Eger could be combined so as to produce the invention claimed in claim 11. Even if such a combination could be made, there is no suggestion in either reference that it be done. Neither reference mentions vortex generation, so a person working in that field would bother to read them. Furthermore there is nothing in either reference which would suggest that the structure resulting from the combination would derive any particular benefit from an axis ratio of approximately 3.0. Finally, Eger states:

"The tips of the high and low wing segments are respectively connected with arrow shaped pylons 8 provided with heading control rudders 9" (Col. 3, lines 59-61)".

That teaches against a combination having flow guides which are located at the tips in order to receive spanwise flowing fluid.. Applicant therefore concludes that his invention as claimed in claim 11 is not obvious and meets the standard set out in 35 USC §103.

Applicant therefore requests reconsideration and prompt favorable action allowing claims 1 - 22.

Respectfully submitted,

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